Abstracts

Oral 11

Musculoskeletal disorders I

O11.1 RELATIONS BETWEEN NECK PAIN AND WORK: WHAT CAN WE LEARN FROM GENDER BASED ANALYSES OF THE 1998 QUEBEC HEALTH AND SOCIAL SURVEY?

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Introduction: Neck pain is a highly prevalent disorder associated with significant disability. Few studies have been able to include a wide range of both personal and workplace risk factors in a single multivariate model and almost none have done so separately by gender.
Methods: Respondents to the 1998 Quebec Health and Social Survey who worked at least 25 hours/week were included in the current analyses: 5405 men and 3987 women. The case definition included those with neck pain during the previous 12 months interfering with usual activities fairly often or all the time. Personal and exposure variables for which at least one response category had a p value <0.25 in univariate analyses were retained for the three backwards stepwise multiple logistic regression models (men, women, total).
Results: Women had a significantly greater prevalence of neck pain (18.4%) than men (10.9%). In all three multiple logistic models, neck pain meeting the case definition was significantly associated with repetitive work, sitting posture, intimidation at work, high psychological job demands, and psychological distress. In men, neck pain was additionally associated with the absence of leisure time physical activity, the use of vibrating hand tools, whole body vibration, frequent exposure to difficult or tense situations with the public and inversely related to education level and the handling of heavy loads, while in women, neck pain was also associated with age over 40, being an ex-smoker, and exposure to unwanted sexual attention at work. All variables significant in one gender or the other were significant in the final model for the total population with the exception of age and education.
Discussion: The results support the important contribution of physical and psychosocial workplace factors to neck pain in both men and women. It highlights significant gender differences in personal factors associated with neck pain that must be taken into account in multivariate analyses.

O11.2 THE BURDEN OF UPPER LIMB MUSCULOSKELETAL DISORDERS DUE TO WORK RELATED FACTORS: RESULTS FROM THE FRENCH PAYS DE LA LOIRE STUDY

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Introduction: In industrial countries, musculoskeletal disorders are one of the leading causes of morbidity and disability. Work is an important, and potentially modifiable, source of risk factors, yet its contribution to musculoskeletal disorders at the population level is largely unknown. We investigated the role of work related biomechanical risk factors in an occupational study set up in France.
Methods: Data came from a cross sectional study of 2600 men and women aged 20–59 years, working in the French Pays de la Loire region. Sociodemographic and work characteristics were collected by questionnaire. Prevalent upper limb musculoskeletal disorders (rotator cuff syndrome, epicondylitis, cubital tunnel syndrome, extensor/flexor tendinitis/tenosynovitis, de Quervain's disease, carpal tunnel syndrome) were ascertained through a clinical examination. Prevalence ratios (PR) for all upper limb disorders, rotator cuff syndrome, and disorders of the elbow or wrist were estimated using Cox regression models with a constant time of follow up and robust variance, adjusting for age, obesity, and diabetes. Additionally, we calculated the population fraction of disease attributable to biomechanical risk factors, and the reduction in the number of cases that would result from a decrease in occupational exposures.
Results: Eleven per cent of men and 18% of women were diagnosed with at least one upper limb musculoskeletal disorder; manual workers were at higher risk than non-manual workers (PRs of 1.6 to 2.0). Musculoskeletal disorders were especially frequent among those whose work required repetitive movements, particularly women. Forceful movements were a stronger risk factor for men. Overall, 22–28% of all upper limb musculoskeletal disorders were attributable to occupational risk factors (45–49% of rotator cuff syndrome cases). Reducing exposure to work related repetitive movements and force exertion could decrease the number of cases by up to 25% among manual men, and up to 30% among manual women.
Conclusion: A large fraction of upper limb musculoskeletal disorders are related to biomechanical risk factors at work. Reducing exposure levels could decrease the burden of musculoskeletal affections in the population, and particularly among manual workers.

O11.3 FEASIBILITY OF A JOB EXPOSURE MATRIX FOR EXPOSURE ASSESSMENT IN STUDIES OF WORK RELATED MUSCULOSKELETAL DISORDERS OF THE UPPER EXTREMITY

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Introduction: Exposure assessment is a methodological concern in studies of work related musculoskeletal disorders (WMD). In large population studies, investigators may lack access to individual exposure data. Job exposure matrices (JEM) have been used successfully in studies of chemical exposures, but have been used in only a few studies of WMD. We explored the feasibility of creating a JEM for studies of upper extremity WMD.
Methods: We examined self-reported exposure data from a cross sectional study of 2600 men and women working in the French Pays de la Loire region. We used CART segmentation methods to evaluate the feasibility of obtaining homogenous exposure groups among different jobs classified according to the French classification of occupations (PCS). We examined four exposures representing the primary risk factors of force, posture, repetition, and vibration.
Results: Preliminary models using broad job categories based on two digit PCS codes and dichotomous exposure variables provided reasonable separation of job categories by the probability of reporting our exposure variables: use of vibrating hand tools, moving objects weighing more than 25 kg, and using the arms over the head or performing repetitive actions for more than four hours daily. For example, the classification trees for use of vibrating hand tools and for repetitive actions each provided six job groupings (terminal nodes) with probabilities of exposure in these job groupings ranging from 9% to 77% (vibration) and 9% to 59% (repetition). Specificity of classification for the four exposures studied ranged from 0.70 to 0.89. Considerable heterogeneity of exposure existed within the broad job classifications used in these preliminary models. We are currently constructing models using four digit job classifications and ordinal ranking of exposures, which will provide greater homogeneity of exposure groupings.
Conclusion: JEM are a potentially useful tool for exposure assessment in studies of WMD. Although some exposure misclassification is likely, this method may allow occupational exposure classification in studies of large population cohorts.

O11.4 USE OF UPPER LIMB MUSCULOSKELETAL DISORDERS QUESTIONNAIRES FOR AN IN-PLANT SURVEILLANCE PROGRAMME

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Introduction: The optimal method for surveillance of upper limb musculoskeletal disorders (UMSD) is still debated, including whether questionnaires and/or physical examination should be used. The study aimed to compare results of standardised questionnaire and physical

examination in a four year surveillance programme carried out in a large shoe factory.
Methods: Between 1996 and 2000, 166 workers were followed. In 1996, the Nordic questionnaire was filled out by the worker alone, and in 1997 and in 2000 the questionnaire was filled out with the occupational physician as interviewer. In 1996, 1997, and 2000, a standardised physical examination (general and specific testing) was performed by the same occupational physician. Disorders were studied into three categories: global, neck/shoulder/arm diseases, and elbow/distal diseases (elbow/forearm/wrist/hand/fingers), with evaluation of sensitivity, specificity, and kappa value for each group, considering physical examination as the reference method. Associations between results of the previous period questionnaire and prevalence/incidence of the disease were studied (p level 0.05).
Results: Agreements between questionnaire and examination were lower in 1996 than in 1997 and 2000, although variability was seen for the last two periods (kappa for global disorders =0.19 (0.07 to 0.33) in 1996, 0.77 (0.67 to 0.86) in 1997, =0.40 (0.27 to 0.53) in 2000. In 1997 and 2000, sensitivity of neck/shoulder/arm questionnaire was excellent (100% in 1997 and 95% in 2000), with a lower specificity (92% and 68% respectively). In 1997 and 2000, specificity of elbow/distal questionnaire was good (91% in 1997 and 88% in 2000), but not the sensitivity (89% in 1997 and 55% in 2000). Symptoms on the 1996 questionnaire were significantly associated with an UMSD in the physical examination of 1997, and symptoms on 1997 with examination in 2000, even for incident cases.
Conclusion: Even with limitations, our study suggested UMSD questionnaires are useful for surveillance, especially when filled by an health specialist. Information from questionnaires was complementary to the physical examination in a surveillance programme.

O11.5 VALIDATION OF A QUESTIONNAIRE TO ASSESS RISK FACTORS AND COMPLAINTS RELATED TO UPPER EXTREMITY DISORDERS

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Introduction: In the Netherlands, occupational health services usually use generic strategies rather than a specific risk profile of the target population for the prevention of upper extremity disorders (UED). A method aimed at establishing such risk profiles followed by a decision tree for selecting interventions based on this, may be more effective for the prevention of UED. Therefore, the aim of this study was to develop a questionnaire that is capable of identifying the specific risk factors for UED and to test its reliability and validity.
Methods: An internet based questionnaire (RSI QuickScan) was developed which consisted of several items on work, workplace, and musculoskeletal health (98 items in total). A number of questions were derived from already validated questionnaires. A total of 159 workers filled in the questionnaire. A test-retest method was applied to study the reliability of the questionnaire and an item analysis was used to test the internal consistency. Concurrent validity was tested by comparing results with results of the original questionnaires. Finally, the predictive validity was cross sectionally explored by logistic regression determining the relation between risk factors and UED.
Results: Test-retest reliability appeared to be sufficient. Generally, the percentage of agreement was over 80% and the Cohen's Kappa was 0.60 or higher. The Cronbach's alpha was mostly between 0.40 and 0.85, showing a reasonable internal consistency. With respect to the concurrent validity, the percentage of agreement appeared to be acceptable (>80%), but the Cohen's Kappas were somewhat lower compared with the test-retest reliability. The logistic regression analyses showed several significant associations, for instance for the items ''workpace and amount of work'' and ''posture and movement'' in association with UED.
Conclusions: The questionnaire generally showed sufficient reliability and validity to be used for the identification of risk factors for UED as a basis for the selection of interventions to prevent UED.

O11.6 EFFORT/REWARD IMBALANCE AND OVERCOMMITMENT IN RELATION TO NECK AND UPPER EXTREMITY SYMPTOMS

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Introduction: Neck and upper extremity symptoms have a multifactorial origin involving several physical, psychosocial and individual risk factors. Siegrist's effort/reward imbalance (ERI) model hypothesises that a combination of high effort and low reward could lead to adverse health effects, which might be even worse for overcommitted workers. Furthermore, overcommitment might have an independent effect. The aim of this study was to examine ERI and overcommitment in relation to neck and upper extremity symptoms.
Methods: A prospective cohort study of 3123 workers from industrial and service companies in Denmark, with three years of follow up. The two determinants were: a combination variable of effort and reward, and overcommitment (both had four categories). The two outcome measures were: symptom scores for the neck/shoulder region and elbow/wrist/hand region. Random coefficient analysis was used to examine the relations between ERI and overcommitment at baseline and both outcome measures at all measurements.
Results: Workers reporting high effort, low reward, and particularly high effort as well as low reward had more symptoms than those reporting neither high effort nor low reward. Furthermore, overcommitted workers reported more symptoms than those without overcommitment. The inclusion of effort/reward and overcommitment in the same model did not lead to a substantial decrease in the coefficients of both determinants, indicating independent relations with symptoms.
Conclusions: Effort/reward imbalance and overcommitment were associated with neck and upper extremity symptoms. Hence, prevention should not exclusively focus on physical risk factors, but should aim at work related psychosocial risk factors too. Attention should also be paid to changeable behaviour resulting from the personality trait overcommitment.

O11.7 EPIDEMIOLOGY OF WORK RELATED MUSCOLOSKELETAL DISORDERS IN APULIA

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Introduction: Work related musculoskeletal disorders (WMSDs) represent a relevant public health issue in Italy in terms of inability and social costs but are grossly underestimated by the National Institute of Workers' Compensation Authority (INAIL).
Methods: A descriptive study was carried out based on Hospital Discharge Records (HDRs) in the Southern region of Apulia in 2001–02, aiming at investigating distribution by sex, age, and geographic area of several musculoskeletal diseases likely to be work related, focusing on occupational bursitis (ICD-9-CM code 727.2) and carpal tunnel syndrome (ICD-9-CM code 354.0). Record linkage of HDRs with social security files (INPS) was conducted to obtain information on individual job title for occupational bursitis. A comparison with INAIL database was also performed to evaluate the degree of underreporting of official occupational diseases.
Results: The results showed increased frequency of WMSDs in 25–64 year old males, and confirmed the well known sex difference in the distribution of carpal tunnel syndrome. No peculiar geographical distribution was observed through the construction of municipality based maps based on age and sex adjusted rates for carpal tunnel syndrome. The record linkage suggested that social security files could be a reliable source in order to obtain information on the role of occupational activity in the occurrence of WMSDs: subjects who received a diagnosis of occupational bursitis were all workers employed in occupations that could be considered ''at risk'' such as building industry (24%), agriculture (20%), cleaning activities (12%), healthcare activities (12%). The validation of the diagnosis of occupational bursitis proved a remarkable underreporting in the INAIL databases.
Conclusion: HDRs could provide useful information for the description of WMSDs. The record linkage activity was validated for occupational bursitis, allowing us to identify the occupational history of each case, and will be applied to more common disease like carpal tunnel syndrome.